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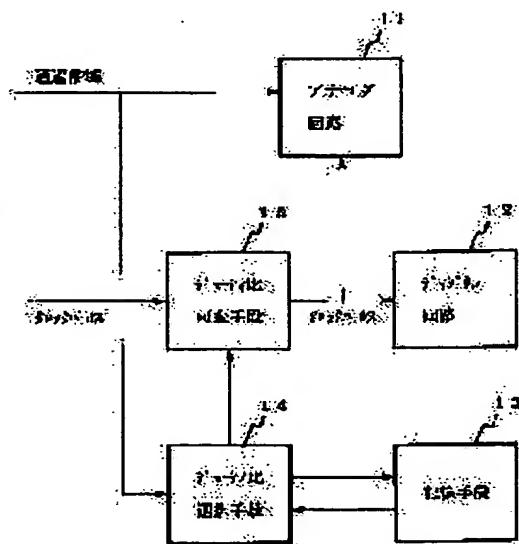
(72)Inventor : MORIYAMA YUKIHIRO

(54) ELECTRONIC EQUIPMENT AND INFORMATION PROCESSOR

(57)Abstract:

PROBLEM TO BE SOLVED: To highly maintain performance and functions while holding adaptivity to a pass band in an operation state and to surely ease restriction to application environments in respect to an electronic equipment provided with an analog circuit and a digital circuit to be driven synchronously with a clock pulse and an information processor arranged in the vicinity of the electronic equipment loading the analog circuit and allowed to be driven synchronously with a clock pulse.

SOLUTION: The electronic equipment provided with the analog circuit 11 and the digital circuit 12 capable of distributing a higher harmonic component to its pass band and allowed to be driven synchronously with a clock pulse is also provided with a storage means 13 for previously storing a duty ratio capable of minimizing the higher harmonic component distributed in the pass band, a duty ratio selecting means 14 for reading out a duty ratio corresponding to a pass band applied from the external from the means 13 and a duty ratio changing means 15 for setting up a duty ratio to a read value.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to electronic equipment equipped with the analog circuit and the digital circuit which operates synchronizing with a clock pulse, and the information management system which is employed near [in which the analog circuit was carried] the electronic equipment, and operates synchronizing with a clock pulse.

[0002]

[Description of the Prior Art] Generally the clock pulse given to a digital circuit as time or the standard of frequency has a rectangular wave, and contains many high order harmonic contents. Therefore, in the radio receiving set which the digital circuit which operates in ***** synchronizing with an analog circuit and a clock pulse is arranged, and changes, the harmonic content of a clock pulse was distributed over the passband of an analog circuit, and it became a disturbance wave, and was received, and interference is given to the original received wave.

[0003] In order to oppress such interference conventionally, modulation processing was performed to the clock pulse, and the advanced technology which oppresses the harmonic content which is made to shift the frequency of the clock pulse and falls in a passband was applied so that it might be carried by for example, a Japanese-Patent-Application-No. No. 20953 [one to] official report, a Japanese-Patent-Application-No. No. 22739 [three to] official report, a Japanese-Patent-Application-No. No. 59583 [one to] official report, and a Japanese-Patent-Application-No. No. 27489 [three to] official report.

[0004]

[Problem(s) to be Solved by the Invention] however, in what performs modulation processing to a clock pulse among the conventional technology mentioned above, if the modulation factor of frequency modulation was not set as the remarkable high value, even if the harmonic content which falls in a passband could not fully oppress or it could oppress the harmonic content which falls in a passband, the frequency of a clock pulse separated from the original value remarkably -- it became a value in many cases Moreover, in that to which the frequency of a clock pulse is shifted, the range of the frequency which a digital circuit makes time and the standard of frequency was not maintained, but the original function was spoiled in many cases.

[0005] this invention aims at offering the electronic equipment by which a performance and a function are maintained highly, being adapted for the passband in an operation situation, and the information management system with which the restrictions in connection with operational environment are eased certainly.

[0006]

[Means for Solving the Problem] Drawing 1 is the principle block diagram of invention according to claim 1.

[0007] In the electronic equipment by which invention according to claim 1 was equipped with the analog circuit 11 and the digital circuit 12 which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of an analog circuit 11 A storage means 13 to store beforehand the duty ratio from which the harmonic content distributed over the passband serves as the minimum corresponding to a passband, The duty ratio selection means 14 which reads the duty ratio corresponding to the passband with reference to the storage means 13

based on the passband given from the outside, It is characterized by having a duty ratio adjustable means 15 to set the duty ratio of a clock pulse as the duty ratio read by the duty ratio selection means 14.

[0008] Drawing 2 is the principle block diagram of invention according to claim 2. The analog circuit 22 which has an output means 21 by which invention according to claim 2 outputs the distribution of the frequency component of a passband, In electronic equipment equipped with the digital circuit 23 which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of an analog circuit 22 A storage means 24 to store beforehand the duty ratio from which the harmonic content distributed over the passband serves as the minimum corresponding to a passband, A man machine interface means 25 to choose any of the duty ratio stored in the storage means 24 based on the instructions inputted they are, It is characterized by having a duty ratio adjustable means 26 to set the duty ratio of a clock pulse as the duty ratio chosen by the man machine interface means 25.

[0009] Drawing 3 is the principle block diagram of invention according to claim 3. In the electronic equipment by which invention according to claim 3 was equipped with the analog circuit 11 and the digital circuit 12 which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of an analog circuit 11 Difference with the desired value which is **** under a passband is made into a control input about the power obtained by the outgoing end of an analog circuit 11, and its power. It is characterized by having the automatic-control section 31 which controls the duty ratio of a clock pulse automatically, and a duty ratio adjustable means 32 to set the duty ratio of a clock pulse as the duty ratio in which automatic control was carried out by the automatic-control section 31.

[0010] Drawing 4 is the principle block diagram of invention according to claim 4. The analog circuit 22 which has an output means 21 by which invention according to claim 4 outputs the distribution of the frequency component of a passband, In electronic equipment equipped with the digital circuit 23 which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of an analog circuit 22 A man machine interface means 24 to take the man machine interface in connection with specification of the duty ratio of a clock pulse, It is characterized by having a duty ratio adjustable means 42 to set the duty ratio of a clock pulse as the duty ratio specified through the man machine interface means 41.

[0011] Drawing 5 is the principle block diagram of invention according to claim 5. In the information management system which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the analog circuit 51 by which invention according to claim 5 has been arranged outside It corresponds to a passband surveillance means 52 to ask for the passband of an analog circuit, and a passband. A storage means 53 to store beforehand the duty ratio from which the harmonic content distributed over the passband serves as the minimum, The duty ratio selection means 54 which reads the duty ratio corresponding to the passband with reference to the storage means 53 based on the passband given from the outside, It is characterized by having a duty ratio adjustable means 55 to set the duty ratio of a clock pulse as the value read by the duty ratio selection means 54.

[0012] Drawing 6 is the principle block diagram of invention according to claim 6. In the information management system with which invention according to claim 6 is employed with the analog circuit 62 including an output means 61 to output the distribution of the frequency component of a passband, and a harmonic content may be distributed over the passband and which carries out a clock pulse synchronization and operates A storage means 63 to store beforehand the duty ratio from which the harmonic content distributed over the passband serves as the minimum about each mode of a passband, A man machine interface means 64 to take the man machine interface in connection with specification of the duty ratio of a clock pulse, It is characterized by having a duty ratio adjustable means 65 to set the duty ratio of a clock pulse as the duty ratio, with reference to the duty ratio stored in the storage means 63 based on specification.

[0013] Drawing 7 is the principle block diagram of invention according to claim 7. In the information management system which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the analog circuit 51 by which invention according to claim 7 has been arranged outside The power obtained by the outgoing end of an analog

circuit 51, and an automatic-control means 71 to control the duty ratio of a clock pulse automatically about the power by making into a control input difference with the desired value which is known under a passband, It is characterized by having a duty ratio adjustable means 73 to set the duty ratio of a clock pulse as the duty ratio in which automatic control was carried out by the automatic-control means 71.

[0014] Drawing 8 is the principle block diagram of invention according to claim 8. Invention according to claim 8 is employed with the analog circuit 62 including an output means 61 to output the distribution of the frequency component of a passband, and is characterized by to have a man machine interface means 81 take the man machine interface in connection with specification of the duty ratio of a clock pulse, and a duty ratio adjustable means 82 set the duty ratio of a clock pulse as the duty ratio specified through the man machine interface means 81 in the information management system which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband.

[0015] By the electronic equipment in connection with invention according to claim 1, the harmonic content of the clock pulse to which a digital circuit 12 synchronizes and operates may be distributed over the passband of an analog circuit 11. the harmonic content distributed over the storage means 13 at the passband corresponding to such a passband -- the minimum -- the duty ratio of a clock pulse is stored beforehand and the duty ratio selection means 14 reads the duty ratio corresponding to the passband by referring to the storage means 13 based on the passband given from the outside about the analog circuit mentioned above

[0016] Thus, in the state where the frequency of a clock pulse mentioned above is generally fixed, the read duty ratio is one of the requirements from which the distribution of the frequency spectrum of the clock pulse changes, and can be computed based on survey in computing beforehand **** by applying the Fourier transform and Fourier series. Therefore, it is oppressed under the duty ratio which the duty ratio adjustable means 15 sets up, without being accompanied by change of the frequency which the higher harmonic distributed over the passband of an analog circuit 11 mentioned above.

[0017] By the electronic equipment in connection with invention according to claim 2, the output means 21 outputs the distribution of the frequency component in the passband of an analog circuit 22, and the harmonic content of the clock with which a digital circuit 23 synchronizes and operates may be distributed over the passband. The storage means 24 stores beforehand the duty ratio from which the harmonic content of the clock pulse individually distributed over the passband about the mode of such a passband serves as the minimum, and chooses the man machine interface means 25 based on the instructions into which it is inputted any of the duty ratio stored by doing in this way they are.

[0018] Thus, in the state where the frequency of a clock pulse mentioned above is generally fixed, the selected duty ratio is one of the requirements from which the distribution of the frequency spectrum of the clock pulse changes, by applying the Fourier transform and Fourier series, can be computed beforehand or can be computed based on survey. Therefore, it is oppressed under the duty ratio which the duty ratio adjustable means 26 sets up, without being accompanied by change of the frequency which the higher harmonic distributed over the passband of an analog circuit 22 mentioned above.

[0019] By the electronic equipment in connection with invention according to claim 3, the harmonic content of the clock pulse to which a digital circuit 12 synchronizes and operates may be distributed over the passband of an analog circuit 11. In the difference of the power with which the automatic-control means 31 is acquired by the output of the analog circuit, and the desired value which is known under the passband which mentioned above about the power, the duty ratio of such a clock pulse is automatically controlled as a control input, and the duty ratio is set up through the duty ratio adjustable means 32.

[0020] That is, without carrying the hardware which stores the duty ratio called for beforehand like a storage means to constitute a claim 1 and electronic equipment according to claim 2, the value of the duty ratio which was adapted for the passband of an analog circuit 11 is set up serially, and the harmonic content of the clock pulse which falls in the band is oppressed certainly. By the electronic equipment in connection with invention according to claim 4, the harmonic content of the clock

pulse to which a digital circuit 23 synchronizes and operates may be distributed over the passband of an analog circuit 22, and the output means 21 which such an analog circuit 22 has outputs the distribution of the frequency component in the passband by it.

[0021] On the other hand, the man machine interface means 24 takes the man machine interface in connection with specification of the duty ratio which should be set up according to the distribution about a clock pulse, and the duty ratio is set up through the duty ratio adjustable means 25. thus, about the number of the duty ratios which should be set up Since the analog circuit 22 is equal to the number of passbands which can be taken according to the gestalt of operation, when there are few the numbers Even if a storage means is not carried in claims 1 and 2 like invention of a publication or an automatic-control means is not carried like invention according to claim 3, the harmonic content which falls in the passband efficiently through the hardware of very simple composition is oppressed.

[0022] In the information management system in connection with invention according to claim 5, an analog circuit 51 is arranged to the exterior of the information management system in connection with this invention. However, an analog circuit 51, the storage means 53, the duty ratio selection means 54, and the duty ratio adjustable means 55 have the same function as the analog circuit 11 indicated by the claim 1, respectively, the storage means 13, the duty ratio selection means 14, and the duty ratio adjustable means 15. Moreover, the passband surveillance means 52 supervises and asks for the passband of the analog circuit, and the reference of the storage means 53 which the duty ratio selection means 54 performs is presented with the passband.

[0023] Therefore, in the information management system in connection with this invention, the harmonic content of the clock pulse which falls in the passband of the analog circuit 51 mentioned above is adapted for the passband, and is reduced certainly.

[0024] In the information management system in connection with invention according to claim 6, the analog circuit 62 including the output means 61 is arranged to the exterior of the information management system in connection with this invention. However, it combines with these output means 61 and an analog circuit 62, and the storage means 63, the man machine interface means 64, and the duty ratio adjustable means 65 have the same function as the output means 21 indicated by the claim 2, respectively, an analog circuit 22, the storage means 24, the man machine interface means 25, and the duty ratio adjustable means 26.

[0025] Therefore, in the information management system in connection with this invention, the harmonic content of the clock pulse which falls in the passband of the analog circuit 62 mentioned above is adapted for the passband, and is reduced certainly. In the information management system in connection with invention according to claim 7, an analog circuit 51 is arranged to the exterior of the information management system in connection with this invention. However, it combines with the analog circuit and the automatic-control means 71 and the duty ratio adjustable means 73 have the same function as the analog circuit 11, the automatic-control means 31, and the duty ratio adjustable means 32 which were indicated by the claim 3, respectively.

[0026] Therefore, in the information management system in connection with this invention, the harmonic content of the clock pulse which falls in the passband of the analog circuit 51 mentioned above is adapted for the passband, and is reduced certainly. In the information management system in connection with invention according to claim 8, the analog circuit 62 including the output means 61 is arranged to the exterior of the information management system in connection with this invention. However, it combines with these output means 61 and analog circuits 62, and the man machine interface means 81 and the duty ratio adjustable means 82 have the same function as the output means 21 indicated by the claim 4, respectively, an analog circuit 22, a digital circuit 23, the man machine interface means 24, and the duty ratio adjustable means 25.

[0027] Therefore, in the information management system in connection with this invention, the harmonic content of the clock pulse which falls in the passband of the analog circuit 62 mentioned above is adapted for the passband, and is reduced.

[0028]

[Embodiments of the Invention] Hereafter, based on a drawing, the operation gestalt of this invention is explained in detail.

[0029] Drawing 9 is drawing showing the first operation gestalt corresponding to invention

according to claim 1. The electric supply edge of an antenna 91 is connected to the input of a demodulator 92, and the output of a clock pulse generator 93 is connected to each part in the radio receiving set in connection with this operation gestalt through the duty ratio adjustable circuit 94. A channel number is given to the input, and a control section 95 has memory 96, and is connected to the input of the duty ratio adjustable circuit 94.

[0030] In addition, about a correspondence relation with the block diagram shown in this operation gestalt and drawing 1, a demodulator 92 corresponds to an analog circuit 11, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 15, a control section 95 corresponds to the duty ratio selection means 14, and memory 96 corresponds to the storage means 13. Hereafter, with reference to drawing 9, operation of this operation gestalt corresponding to invention according to claim 1 is explained.

[0031] A demodulator 92 receives the received wave of the radio channel corresponding to the channel number given from the outside among the received waves which arrive at an antenna 91. The duty ratio corresponding to such a channel number and its channel number mentioned later is beforehand stored in memory 96. A control section 95 gives the duty ratio to the duty ratio adjustable circuit 94 while it gives it from the outside and it reads the duty ratio corresponding to the channel number with reference to memory 96 based on a **** channel number, as mentioned above.

[0032] The duty ratio adjustable circuit 94 sets up the duty ratio of the clock pulse generated by the duty ratio by the clock generator 93. By the way, a harmonic content is [Equation 1], when a wave is a rectangle, and angular frequency, a duty ratio, and an amplitude are given by omega, D, and A, respectively and the absolute value of a phase can be disregarded about such a clock pulse.

$$k(t) = A D + \sum_{n=1} \frac{2A}{\pi n} \sin(n\omega D)$$

It is shown by ** Fourier series.

[0033] That is, since it fluctuates certainly according to duty ratio D even if angular frequency omega of a harmonic content is fixed regardless of Degree n, about the duty ratio which should be stored in memory 96, computing beforehand is possible as a value from which the harmonic content of the clock pulse distributed over the receiving band of the radio channel shown by each channel number serves as the minimum.

[0034] Moreover, since each part which operates synchronizing with a clock pulse operates ignited by the standup (or falling) of the clock pulse, it is possible to maintain the timing of the operation regardless of a duty ratio. Therefore, according to this operation gestalt, the harmonic content of the clock pulse which falls in a receiving band is oppressed, and the S/N ratio of a demodulator 92 is raised, and by the built-in digital circuit, it operates stably, without changing timing of operation.

[0035] In addition, about the adjustable circuit 94 of a duty ratio, since any well-known technology is applicable as long as precision, a response, and a property suit, explanation here is omitted. Moreover, with this operation gestalt, although the optimal duty ratio is drawn based on Fourier series, it is not limited to the method of such calculation, but you may ask for the optimal duty ratio similarly by survey.

[0036] Drawing 10 is drawing showing the second operation form corresponding to invention according to claim 1. In drawing, the difference of composition with the operation form shown in drawing 9 is in the point that replaced with the clock pulse generator 93 and the clock pulse regenerative circuit 103 was formed.

[0037] With this operation form, the clock pulse regenerative circuit 103 incorporates a received wave, reproduces a clock pulse, replaces with the clock pulse pulse oscillator 93 shown in drawing 9, and supplies each part. however, it is possible for the source of generation to be [how] alike, and not to be concerned about such a clock pulse, but to carry out adjustable [of the duty ratio] by the duty ratio adjustable circuit 94, if frequency is known

[0038] Therefore, with this operation form, the harmonic content of the clock pulse which falls in a receiving band like the operation implementation form shown in drawing 9 is oppressed, and the S/N ratio of a demodulator 92 is raised, and in the built-in digital circuit, it operates stably, without changing timing of operation. Drawing 11 is drawing showing the third operation form corresponding to invention according to claim 1.

[0039] In drawing, it replaces with a demodulator 92, the transceiver machine 112 is formed, and the

difference of composition with the operation form shown in drawing 9 is in the point that the output of a clock pulse generator 93 was connected to the transceiver machine 112 through the duty ratio adjustable circuit 94. With this operation form, a clock pulse is given to the transceiver machine 112 and the determination of the timing to which the transceiver machine 112 sends out transmission information is presented with it.

[0040] However, about such a clock pulse, generally frequency is given as a known value based on transmission speed, and adjustable [of the duty ratio] is carried out by the duty ratio adjustable circuit 94. Therefore, with this operation form, the harmonic content of the clock pulse which falls in a receiving band like the operation implementation form shown in drawing 9 is oppressed, and the S/N ratio of the transceiver machine 112 is raised, and in the built-in digital circuit, it operates stably, without changing timing of operation.

[0041] Drawing 12 is drawing showing the operation form corresponding to invention according to claim 2. In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 9 , the same sign is given and shown and the explanation is omitted here.

[0042] The difference of composition with the operation form shown in this operation form and drawing 9 is in the point that replaced with the control section 95, the control section 125 was formed, the loudspeaker 122 was connected to the output of a demodulator 92, and the switch 121 was connected to the input of a control section 125. In addition, about a correspondence relation with the block diagram shown in this operation form and drawing 2 , a demodulator 92 corresponds to an analog circuit 22, a loudspeaker 122 corresponds to the output means 21, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 26, a control section 125 and a switch 121 correspond to the man machine interface means 25, and memory 96 corresponds to the storage means 24.

[0043] Hereafter, operation of this operation form is explained. Although a loudspeaker 122 changes and outputs the recovery signal which a demodulator 92 outputs to an acoustic signal, when the high order harmonic content of the clock pulse generated with the clock pulse generator 93 falls in a receiving band, noise follows it on the acoustic signal. The man machine interface which chooses any of the duty ratio of the shoes memorized in memory 96 is presented with a switch 121.

[0044] A control section 125 chooses any of the duty ratio which made a note under the man machine interface, and was stored in 96 they are, and gives it to the duty ratio adjustable circuit 94.

[it] However, the frame of selection of a duty ratio with which the noise level mentioned above serves as the minimum about the value of such a duty ratio since it is computed beforehand individually about all the radio channels that a demodulator 92 should make the object of a recovery is determined by the number of the radio channels of this.

[0045] Therefore, with this operation form, the harmonic content of the clock pulse which operability is highly maintained while simplification and cheap-izing of the composition of hardware are attained, and falls in the receiving band of a demodulator 92 is oppressed certainly. Drawing 13 is drawing showing the operation form corresponding to invention according to claim 3.

[0046] In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 9 , the same sign is given and shown and the explanation is omitted here. It replaces with a control section 95, a control section 135 is formed, and the difference of composition with the operation form shown in this operation form and drawing 9 is in the point that memory 96 was deleted. In addition, about a correspondence relation with the block diagram shown in this operation form and drawing 3 , a demodulator 92 corresponds to an analog circuit 11, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 32, and a control section 135 corresponds to the automatic-control means 31.

[0047] Hereafter, operation of this operation form is explained. In the situation that the harmonic content of the clock pulse generated by the clock pulse oscillator circuit 93 does not fall in the band of a demodulator 92, the level of the recovery signal acquired by the output of the demodulator 92 is beforehand set to a control section 135 as a threshold. While the demodulator 92 is performing recovery processing, a control section 135 distinguishes the size relation between the level of the recovery signal acquired from the demodulator 92, and the threshold mentioned above.

[0048] Moreover, a control section 135 distinguishes whether the duty ratio and the level of the

recovery signal mentioned above have correlation by carrying out adjustable [of the duty ratio of a clock pulse] through the duty ratio adjustable circuit 94, when the former has exceeded the latter as a result of the distinction. Furthermore, when it has been recognized as a control section 135 having correlation to both as a result of the distinction, the duty ratio is automatically controlled by making such difference into a control input, and carrying out adjustable [of the duty ratio] through the duty ratio adjustable circuit 94 by making the threshold into the purpose value.

[0049] Therefore, the harmonic content of the clock pulse which falls in the receiving band of a demodulator 92 is oppressed certainly, without carrying memory 96 like a claim 1 and the operation form corresponding to invention according to claim 2 according to this operation form. Drawing 14 is drawing showing the operation form corresponding to invention according to claim 4.

[0050] In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 12 , the same sign is given and shown and the explanation is omitted here. A control section 125 and memory 96 are deleted, and the difference of composition with the operation form shown in this operation form and drawing 12 is in the point that replaced with the switch 121 and the duty ratio control unit 141 was formed.

[0051] In addition, about a correspondence relation with the block diagram shown in this operation form and drawing 4 , a demodulator 92 corresponds to an analog circuit 22, a loudspeaker 122 corresponds to the output means 21, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 42, and the duty ratio control unit 141 corresponds to the man machine interface means 41. Although the duty ratio set up through the duty ratio control unit 141 is minded duty ratio adjustable circuit 94 and it is set as a clock pulse with this operation form, about the number of the duty ratios which should be set up by doing in this way, it is equal to the number of the bands which a demodulator 92 may have according to the form of operation.

[0052] Therefore, when there are few bands mentioned above, even if memory 96 is not carried like a claim 1 and the operation form corresponding to invention according to claim 2 or the hardware which performs automatic control like invention according to claim 3 is not carried with this operation form, it becomes possible to oppress the harmonic content which falls in the receiving band of a demodulator 92 efficiently through the hardware of very simple composition.

[0053] Drawing 15 is drawing showing the operation form corresponding to invention according to claim 5. In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 9 , the same sign is given and shown and the explanation is omitted here. The difference of composition with the operation form shown in this operation form and drawing 9 is in the point of having made it following on the control section 155 and memory 96 which are replaced with the radio receiving set which consists of an antenna 91 and a demodulator 92, and the personal computer of another object at a clock pulse generator 93, the duty ratio adjustable circuit 94, and a control section 95, and having had the channel judging section 151.

[0054] In addition, about a correspondence relation with the block diagram shown in this operation form and drawing 5 , a demodulator 92 corresponds to an analog circuit 51, the channel judging section 151 corresponds to the passband surveillance means 52, a control section 155 corresponds to the duty ratio selection means 54, memory 96 corresponds to the storage means 53, and the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 55.

[0055] Hereafter, operation of this operation form is explained. The duty ratio which was individually adapted for memory 96 like the operation form corresponding to invention according to claim 1 at the channel number is memorized beforehand, and the channel judging section 151 incorporates the channel number set as the radio receiving set installed outside, and notifies it to a control section 155. By making a note based on such a channel number, and referring to 96, a control section 155 acquires the duty ratio which was adapted for the channel number, and gives it to the duty ratio adjustable circuit 94.

[0056] Therefore, according to this operation form, the harmonic content of the clock pulse which falls in the receiving band of the radio receiving set installed outside is oppressed, and the restrictions in connection with the position which can be installed, or environment and others' with the receiving set are mitigated sharply. [a relative distance and] Drawing 16 is drawing showing the operation form corresponding to invention according to claim 6. In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 12 , the same

sign is given and shown and the explanation is omitted here.

[0057] The difference of composition with the operation form shown in this operation form and drawing 12 is in the point that a clock pulse generator 93, the duty ratio adjustable circuit 94, a control section 125, and memory 96 were built in the radio receiving set which consists of an antenna 91, a demodulator 92, and a loudspeaker 122, and the personal computer of another object. In addition, about a correspondence relation with the block diagram shown in this operation form and drawing 6, a demodulator 92 corresponds to an analog circuit 62, a loudspeaker 122 corresponds to the output means 61, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 65, a control section 125 and a switch 121 correspond to the man machine interface means 64, and memory 96 corresponds to the storage means 63.

[0058] The clock pulse generator 93, the duty ratio adjustable circuit 94 and control section 125 which were mounted in the personal computer with this operation form, and memory 96, About the antenna 91, the demodulator 92, and loudspeaker 122 which were mounted in the radio receiving set Since the thing, the function, and composition which were mounted in the operation form according to claim 2 are the same and all have them also about the connection relation between these components as mentioned above, the explanation in connection with operation of these components is omitted here. [same]

[0059] Therefore, with this operation form, since the duty ratio which was adapted for the channel number is chosen certainly, the harmonic content of the clock pulse which falls in the receiving band of the radio receiving set installed outside like the operation form corresponding to invention according to claim 5 is oppressed, and the restrictions in connection with the position which can be installed, or environment and others with the receiving set are mitigated sharply. [a relative distance and]

[0060] Drawing 17 is drawing showing the operation form corresponding to invention according to claim 7. In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 13, the same sign is given and shown and the explanation is omitted here. The difference of composition with the operation form shown in this operation form and drawing 13 is in the point that the clock pulse generator 93, the duty ratio adjustable circuit 94, and the control section 135 were built in the radio receiving set which consists of an antenna 91 and a demodulator 92, and the personal computer of another object.

[0061] In addition, about a correspondence relation with the block diagram shown in this operation form and drawing 7, a demodulator 92 corresponds to an analog circuit 51, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 73, and a control section 135 corresponds to the automatic-control means 71. The clock pulse generator 93, the duty ratio adjustable circuit 94, and control section 125 which were mounted in the personal computer with this operation form, About the antenna 91 and demodulator 92 which were mounted in the radio receiving set Since the thing, the function, and composition which were mounted in the operation form according to claim 3 are the same and all have them also about the connection relation between these components as mentioned above, the explanation in connection with operation of these components is omitted here. [same]

[0062] Therefore, with this operation form, the duty ratio which was adapted for the receiving band with automatic control is set up certainly, and like the operation form corresponding to invention according to claim 6, while the harmonic content of the clock pulse which falls in the receiving band of the radio receiving set installed outside is oppressed, the restrictions in connection with the position which can be installed, or environment and others' with the receiving set are mitigated sharply. [a relative distance and]

[0063] Drawing 18 is drawing showing the operation form corresponding to invention according to claim 8. In drawing, about what has the thing, the the same function, and the same composition which are shown in drawing 14, the same sign is given and shown and the explanation is omitted here. The difference of composition with the operation form shown in this operation form and drawing 14 is in the point that the clock pulse generator 93, the duty ratio adjustable circuit 94, and the duty ratio control unit 141 were built in the radio receiving set which consists of an antenna 91, a demodulator 92, and a loudspeaker 122, and the personal computer of another object.

[0064] In addition, about a correspondence relation with the block diagram shown in this operation

form and drawing 8 , a demodulator 92 corresponds to an analog circuit 62, a loudspeaker 122 corresponds to the output means 61, the duty ratio adjustable circuit 94 corresponds to the duty ratio adjustable means 82, and the duty ratio control unit 141 corresponds to the man machine interface means 81. The clock pulse generator 93, the duty ratio adjustable circuit 94, and the duty ratio control unit 141 which were mounted in the personal computer with this operation form, About the antenna 91, the demodulator 92, and loudspeaker 122 which were mounted in the radio receiving set Since the thing, the function, and composition which were mounted in the operation form according to claim 4 are the same and all have them also about the connection relation between these components as mentioned above, the explanation in connection with operation of these components is omitted here. [same]

[0065] Therefore, with this operation gestalt, the duty ratio which was adapted for the receiving band through the hardware of very simple composition is set up certainly, and like the operation gestalt corresponding to invention according to claim 7, while the harmonic content of the clock pulse which falls in the receiving band of the radio receiving set installed outside is oppressed, the restrictions in connection with the position which can be installed, or environment and others' with the receiving set are mitigated sharply. [a relative distance and]

[0066] In addition, although the operation gestalt shown in drawing 15 -18 limited and explained the personal computer which adjoins a radio receiving set and is installed to one, the same effect is acquired even if it installs two or more these information management systems in ***** . Moreover, about each operation gestalt mentioned above, it is also possible to increase the reduction effect of interference further by applying collectively the well-known technology of planning frequency modulation of the frequency shift of a clock pulse, or a clock pulse.

[0067]

[Effect of the Invention] The component which falls in the passband of an analog circuit among the harmonic contents of the clock pulse is oppressed certainly, keeping constant the frequency of the clock pulse given to a digital circuit in a claim 1 or invention according to claim 4, as mentioned above. Moreover, in a claim 5 or invention according to claim 8, the restrictions in connection with relativity distance and position of a place which should be installed to the electronic equipment by which the analog circuit was carried are eased.

[0068] Therefore, in electronic equipment and the information management system to which these invention was applied, a performance is maintained highly, and the flexibility of reliability and installation environment improves sharply, and the efficiency of maintenance and employment is raised.

[Translation done.]

* NOTICES *

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2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] Electronic equipment equipped with the analog circuit and the digital circuit which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the aforementioned analog circuit characterized by providing the following. A storage means to store beforehand the duty ratio from which the aforementioned harmonic content distributed over the passband serves as the minimum corresponding to the aforementioned passband. The duty ratio selection means which reads the duty ratio corresponding to the passband with reference to the aforementioned storage means based on the passband given from the outside. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio read by the aforementioned duty ratio selection means.

[Claim 2] Electronic equipment equipped with the analog circuit which has an output means characterized by providing the following to output the distribution of the frequency component of a passband, and the digital circuit which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the aforementioned analog circuit. A storage means to store beforehand the duty ratio from which the aforementioned harmonic content distributed over the passband serves as the minimum corresponding to the aforementioned passband. A man machine interface means to choose any of the duty ratio stored in the aforementioned storage means based on the instructions inputted they are. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio chosen by the aforementioned man machine interface means.

[Claim 3] Electronic equipment equipped with the analog circuit and the digital circuit which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the aforementioned analog circuit characterized by providing the following. Power obtained by the outgoing end of the aforementioned analog circuit. The automatic-control section which controls the duty ratio of the aforementioned clock pulse automatically about the power by making into a control input difference with the desired value which is known under the aforementioned passband. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio in which automatic control was carried out by the aforementioned automatic-control section.

[Claim 4] Electronic equipment equipped with the analog circuit which has an output means characterized by providing the following to output the distribution of the frequency component of a passband, and the digital circuit which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the aforementioned analog circuit. A man machine interface means to take the man machine interface in connection with specification of the duty ratio of the aforementioned clock pulse. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio specified through the aforementioned man machine interface means.

[Claim 5] The information management system which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the analog circuit arranged outside characterized by providing the following. A passband surveillance means to ask for the passband of the aforementioned analog circuit. A storage means to store beforehand the duty ratio from which the aforementioned harmonic content distributed over the passband serves as the

minimum corresponding to the aforementioned passband. The duty ratio selection means which reads the duty ratio corresponding to the passband with reference to the aforementioned storage means based on the passband given from the outside. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the value read by the aforementioned duty ratio selection means.

[Claim 6] The information management system which operates synchronizing with the clock pulse from which it is applied with an analog circuit including an output means characterized by providing the following to output the distribution of the frequency component of a passband, and a harmonic content may be distributed over the passband. A storage means to store beforehand the duty ratio from which the aforementioned harmonic content distributed over the passband serves as the minimum about each mode of the aforementioned passband. A man machine interface means to take the man machine interface in connection with specification of the duty ratio of the aforementioned clock pulse. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio with reference to the duty ratio stored in the aforementioned storage means based on the aforementioned specification.

[Claim 7] The information management system which operates synchronizing with the clock pulse from which a harmonic content may be distributed over the passband of the analog circuit arranged outside characterized by providing the following. Power obtained by the outgoing end of the aforementioned analog circuit. An automatic-control means to control the duty ratio of the aforementioned clock pulse automatically about the power by making into a control input difference with the desired value which is known under the aforementioned passband. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio in which automatic control was carried out by the aforementioned automatic-control means.

[Claim 8] The information management system which operates synchronizing with the clock pulse from which it is applied with an analog circuit including an output means characterized by providing the following to output the distribution of the frequency component of a passband, and a harmonic content may be distributed over the passband. A man machine interface means to take the man machine interface in connection with specification of the duty ratio of the aforementioned clock pulse. A duty ratio adjustable means to set the duty ratio of the aforementioned clock pulse as the duty ratio specified through the aforementioned man machine interface means.

[Translation done.]

* NOTICES *

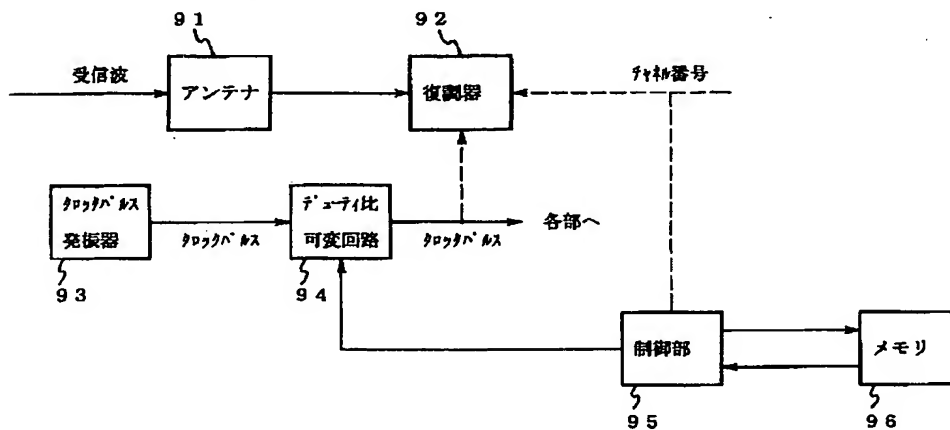
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3. In the drawings, any words are not translated.

DRAWINGS

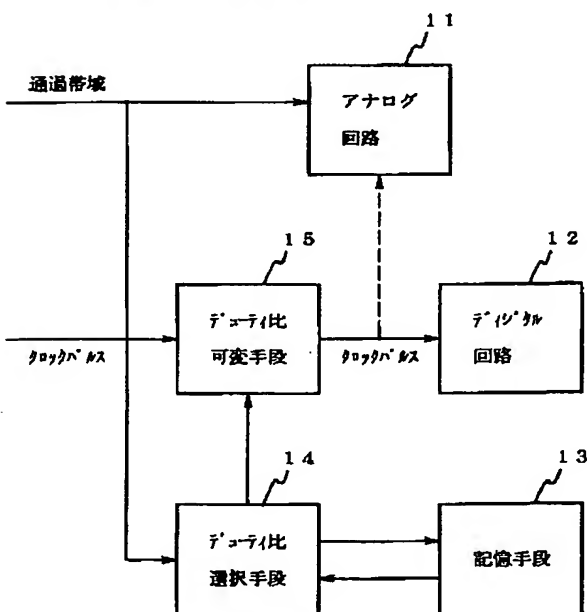
[Drawing 9]

請求項 1 に記載の発明に対応した第一の実施形態を示す図



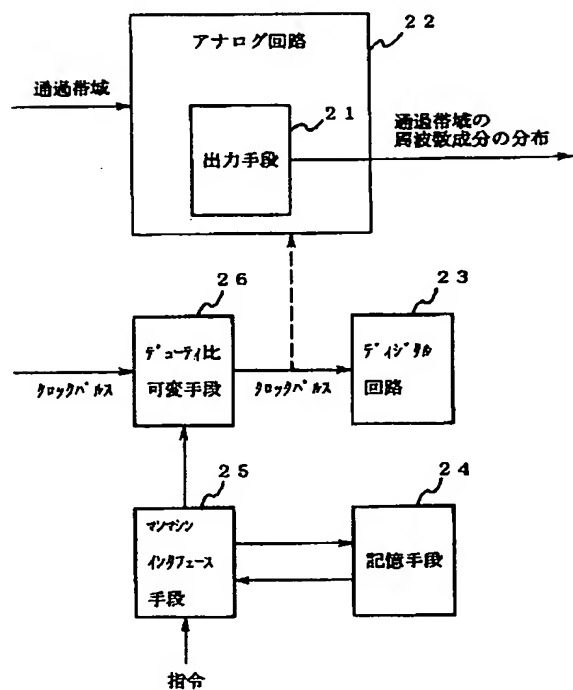
[Drawing 1]

請求項 1 に記載の発明の原理ブロック図



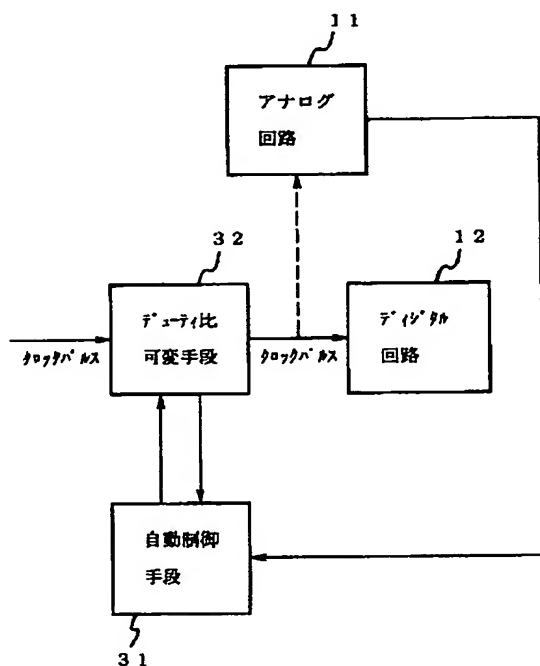
[Drawing 2]

請求項 2 に記載の発明の原理ブロック図



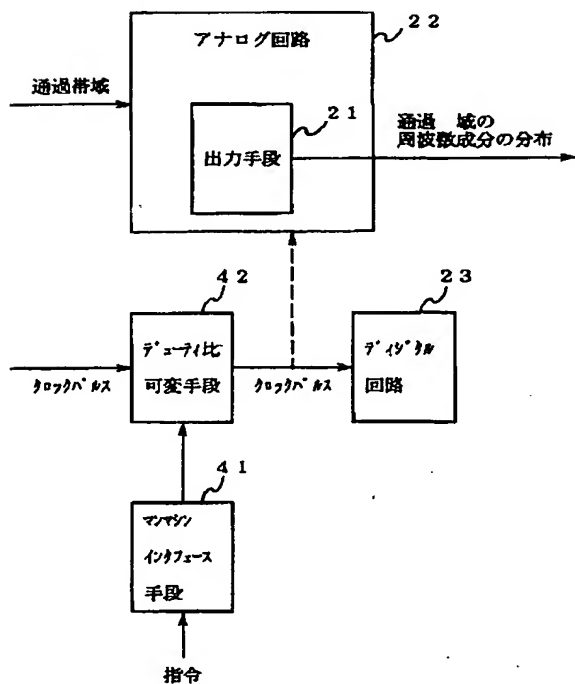
[Drawing 3]

請求項 3 に記載の発明の原理ブロック図



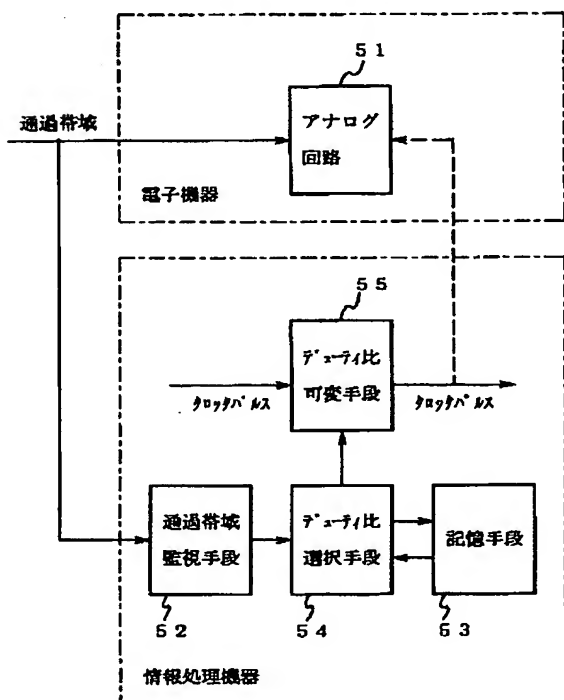
[Drawing 4]

請求項4に記載の発明の原理ブロック図



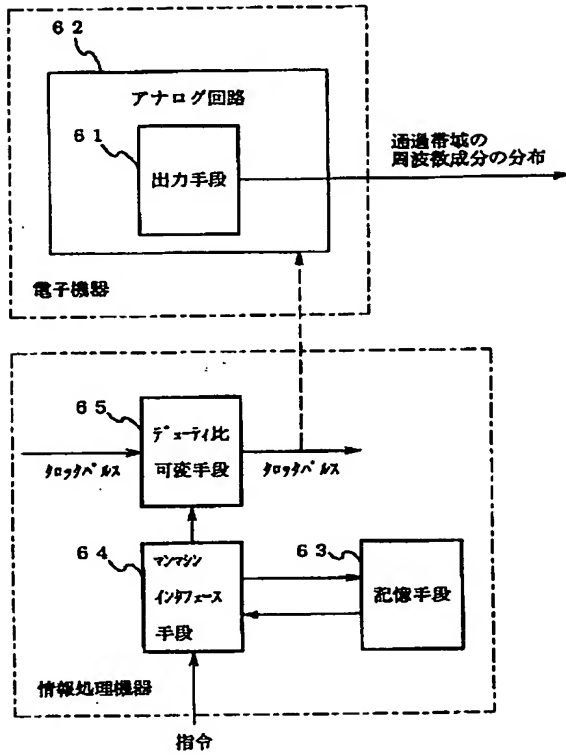
[Drawing 5]

請求項5に記載の発明の原理ブロック図



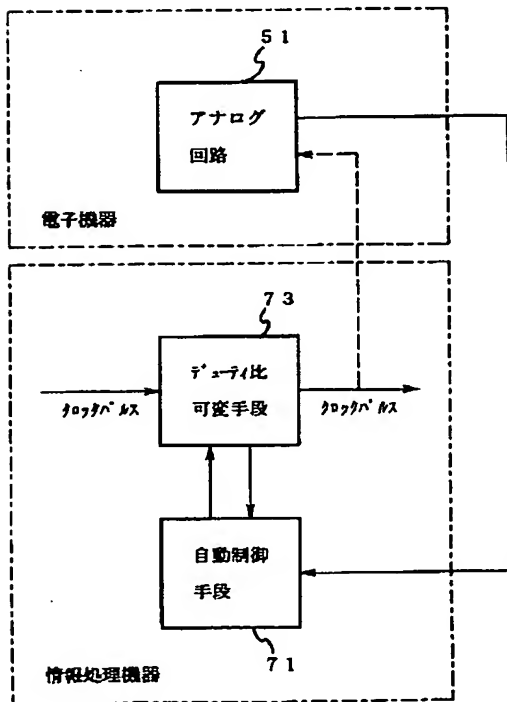
[Drawing 6]

請求項6記載の発明の原理ブロック図



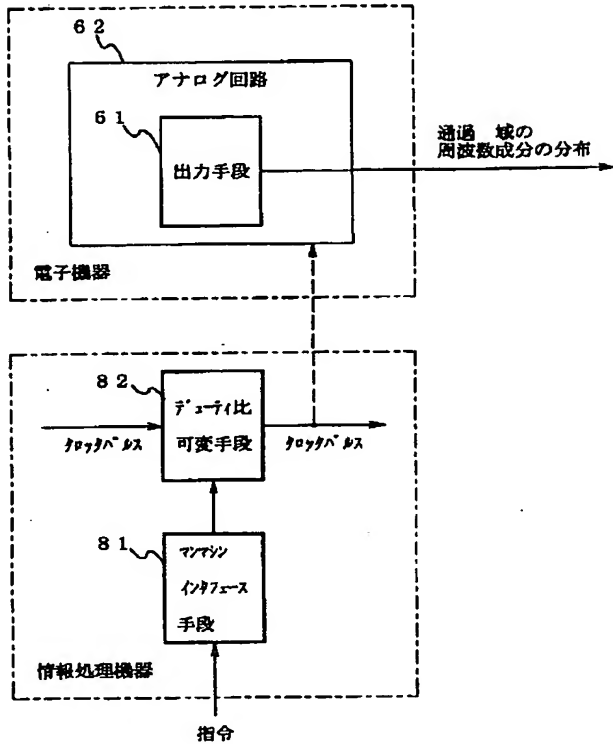
[Drawing 7]

請求項7に記載の発明の原理ブロック図



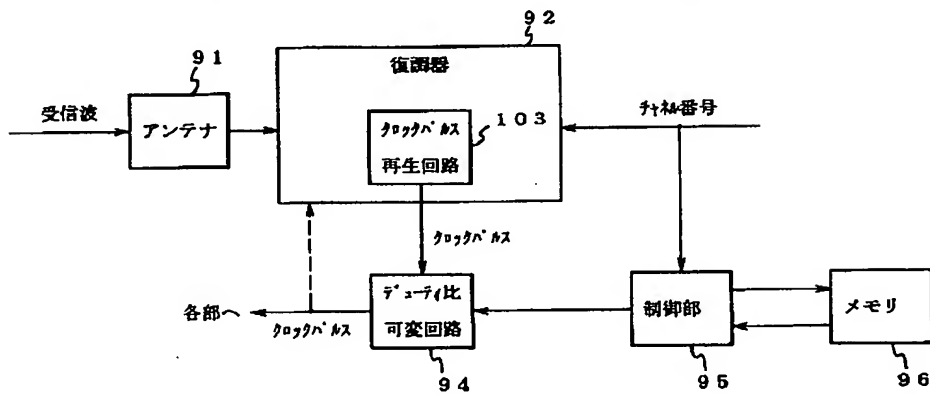
[Drawing 8]

請求項 8 に記載の発明の原理ブロック図



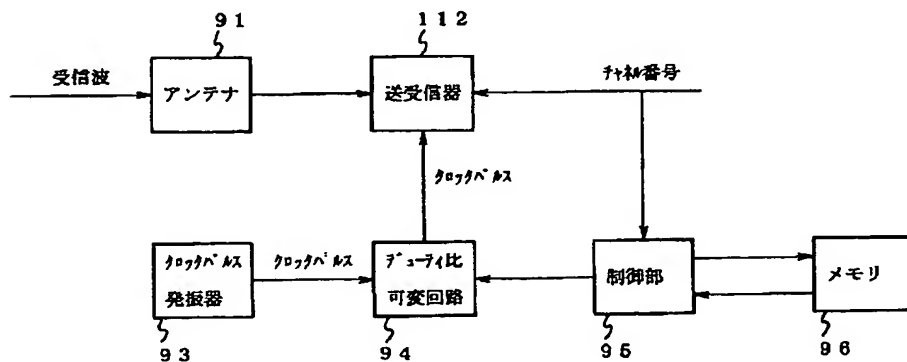
[Drawing 10]

請求項 1 に記載の発明に対応した第二の実施形態を示す図



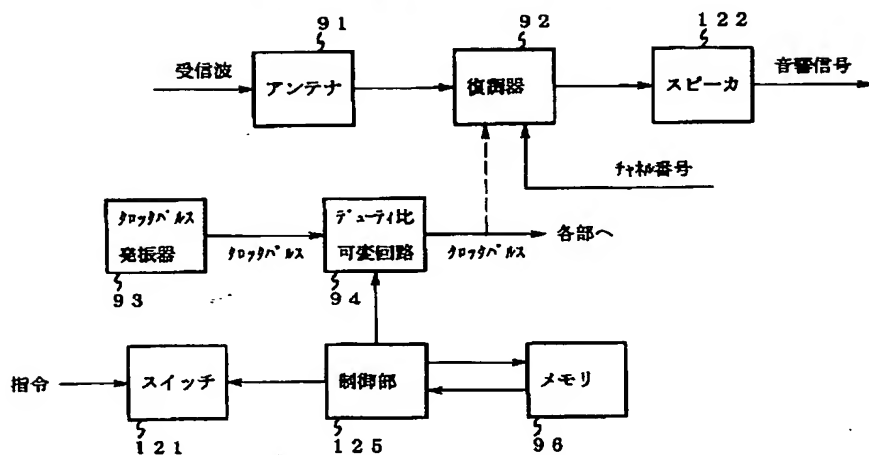
[Drawing 11]

請求項 1 に記載の発明に対応した第三の実施形態を示す図



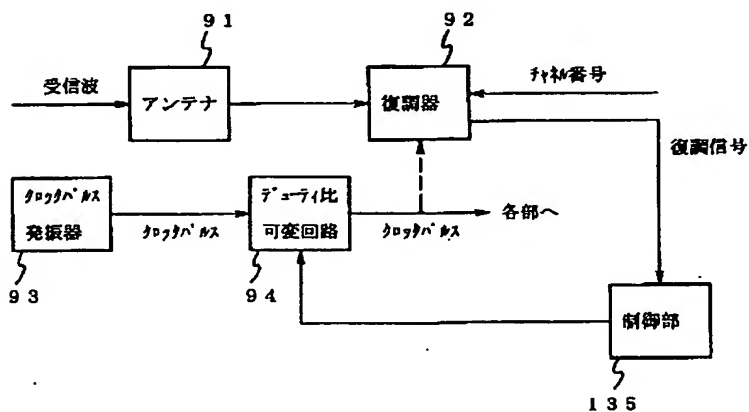
[Drawing 12]

請求項 2 に記載の発明に対応した実施形態を示す図



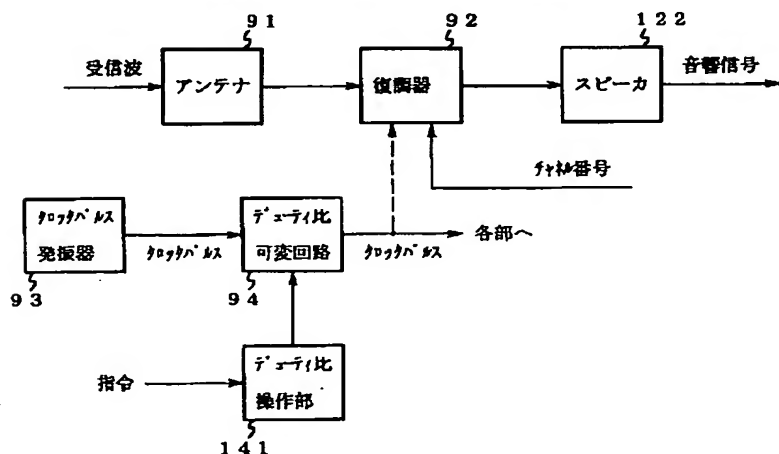
[Drawing 13]

請求項 3 に記載の発明に対応した実施形態を示す図



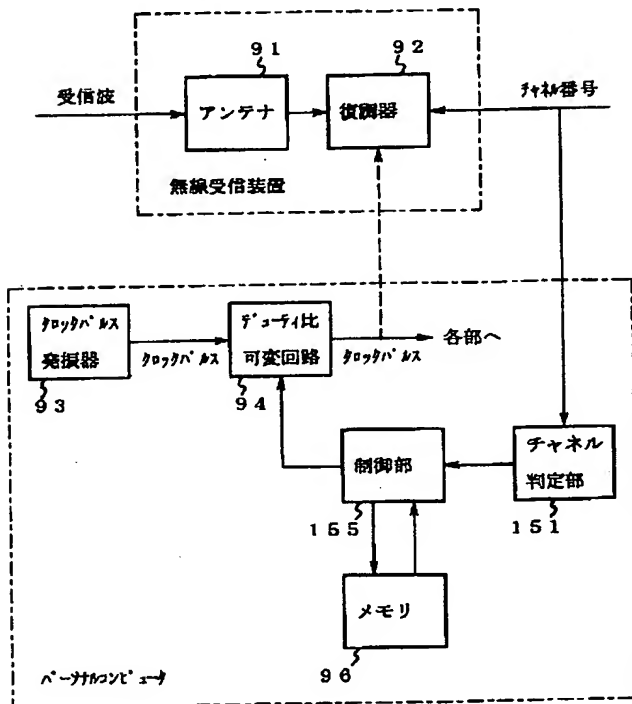
[Drawing 14]

請求項 4 に記載の発明に対応した実施形態を示す図



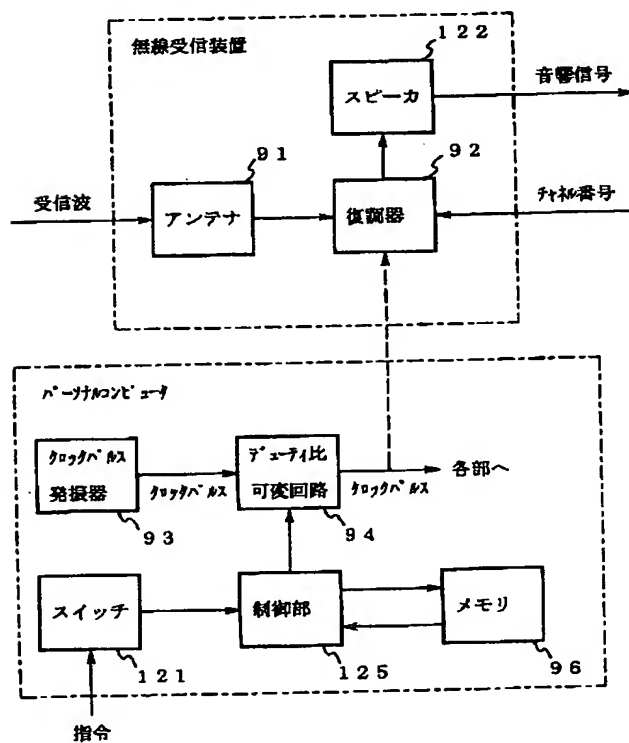
[Drawing 15]

請求項 5 に記載の発明に対応した実施形態を示す図



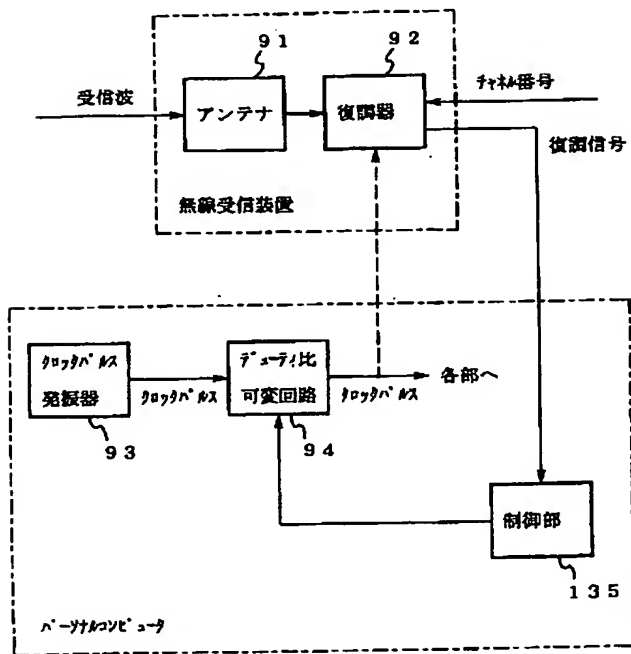
[Drawing 16]

請求項 6 に記載の発明に対応した実施形態を示す図



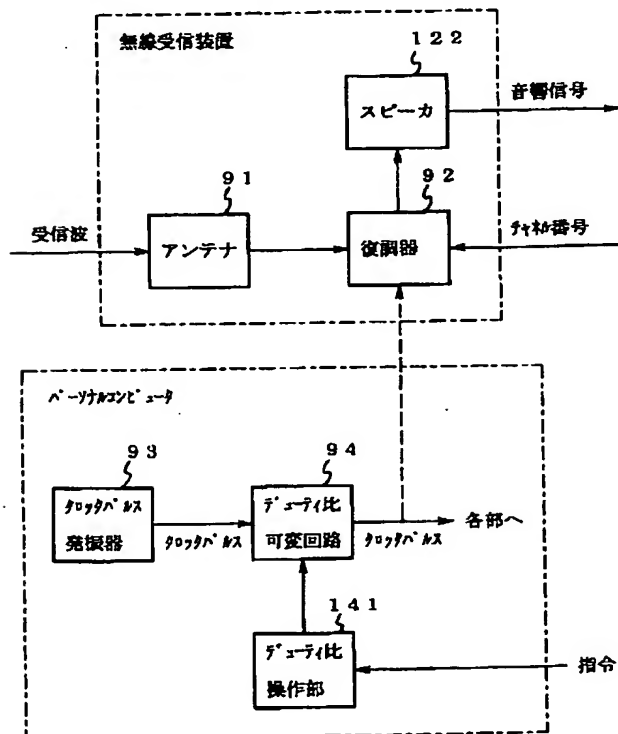
[Drawing 17]

請求項 7 に記載の発明に対応した実施形態を示す図



[Drawing 18]

請求項 8 に記載の発明に対応した実施形態を示す図



[Translation done.]

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